

Mixed Reality Crew Assistance (MRC)

Completed Technology Project (2016 - 2018)



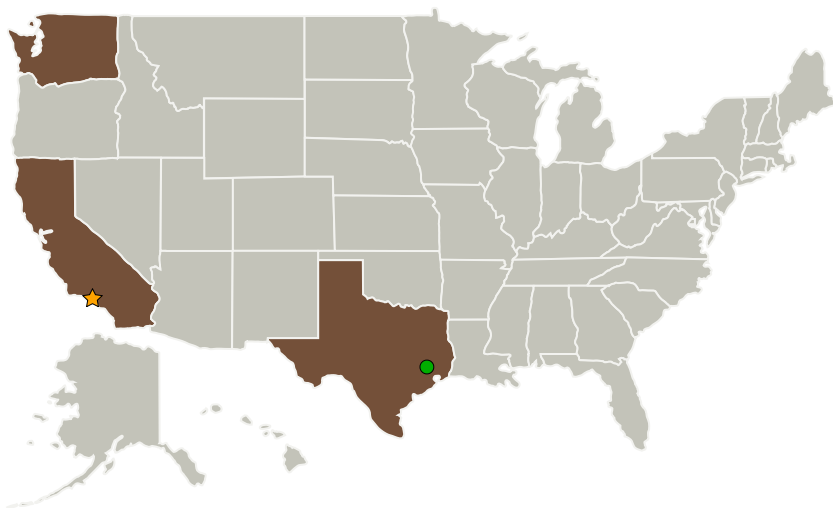
Project Introduction

Mixed Reality technologies will increase the utilization of the ISS and enable greater crew autonomy for missions beyond Earth orbit. Crew activities today are governed by difficult to follow written procedures and inefficient interactions with ground operators. This effort aims to target 2x improvement in task execution speed and 50% reduction in task errors.

Anticipated Benefits

NASA Funded: Improve Crew Productivity and Reduce Errors##NASA
Unfunded: Asynchronous procedural assistance for long-duration crew
missions##OGA: Location based procedure operations for any
industry##Industry: Improve Crew Productivity and Reduce Errors##Nation:
Location based procedure operations for any industry#

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Jet Propulsion Laboratory(JPL)	Lead Organization	NASA Center	Pasadena, California
● Johnson Space Center(JSC)	Supporting Organization	NASA Center	Houston, Texas



Mixed Reality Crew Assistance

Table of Contents

Project Introduction	1
Anticipated Benefits	1
Primary U.S. Work Locations and Key Partners	1
Organizational Responsibility	1
Project Transitions	2
Project Website:	2
Project Management	2
Technology Maturity (TRL)	2
Target Destinations	2

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Jet Propulsion Laboratory (JPL)

Responsible Program:

Game Changing Development

Mixed Reality Crew Assistance (MRC)


Completed Technology Project (2016 - 2018)



Co-Funding Partners	Type	Location
Mars rover operations	NASA Other	
Planetary Science	NASA Program	

Primary U.S. Work Locations	
California	Texas
Washington	

Project Transitions

 **October 2016:** Project Start

 **March 2018:** Closed out

Closeout Summary: The Mixed Reality Crew Assistance (MRCA) goal was to leverage immersive visualization technologies to allow for procedures to be authored virtually on the ground and executed on top of an aligned workspace in a remote location such as the ISS or cleanroom. This allows for operators to develop and playback instructions in 3D, where and when they need it. The project intended to deliver quantifiable results from our model alignment and procedure playback capabilities during the first year of project implementation when it was terminated early due to a shift in funding priorities. Evaluation of alignment techniques and procedure schemas were completed demonstrating the ability to align a virtual model to a physical object.

Project Website:

https://www.nasa.gov/directorates/spacetech/game_changing_development/in

Project Management

Program Director:

Mary J Werkheiser

Program Manager:

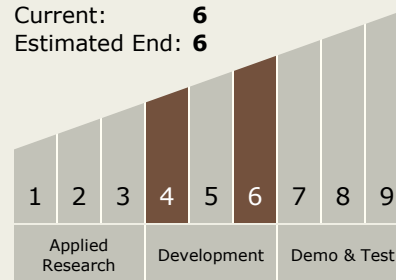
Gary F Meyering

Principal Investigator:

Victor X Luo

Technology Maturity (TRL)

Start: 4
Current: 6
Estimated End: 6



Target Destinations

The Moon, Mars, Earth